User's Guide

micro-line®

Power Supply

Kit

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Orsys Orth System GmbH, Am Stadtgraben 1, 88677 Markdorf, Germany
phone: +49 (0)7544 / 9561-0, fax: / 9561-29, email: sales@orsys.de, web-site: http://www.orsys.de
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1. General

The micro-line® Power Supply Kit is a stand-alone carrier platform for the complete micro-line® processor and peripheral board family. The PowerSupply Kit includes all necessary components and considerably facilitates the operation of the boards. Additional cables, plugs or galvanically isolated power supplies are not required.

The micro-line® PowerSupply Kit includes the following components:

- mechanical connectors enable piggy-back plugging for all micro-line® boards (up to seven peripheral boards and one processor board can be plugged onto each other)

- 220V power supply with separate universal AC adaptor (max 12V DC, 9,6VA)

- +5V switched voltage regulator to generate a high current digital +5V voltage supply (up to 2,5 A)

- ±15V DC/DC converter (4 versions, as listed below) to generate up to four galvanically isolated power supplies for sensitive AD or DA converter peripheral boards
  (version /1: without ±15V DC/DC converter)
  (version /2: one ±15V DC/DC converter for analog components supply)
  (version /3: one ±15V DC/DC converter for IEEE 1394 cable environment or other clean but non-analog isolated supplies)
  (version /4: two ±15V DC/DC converters with double output current, both for analog components, or one for analog supply and one for IEEE 1394 cable environment supply)

- SUB-D 9 pole RS232 interface: PC-compatible, with null-modem cable for a direct connection to a development PC

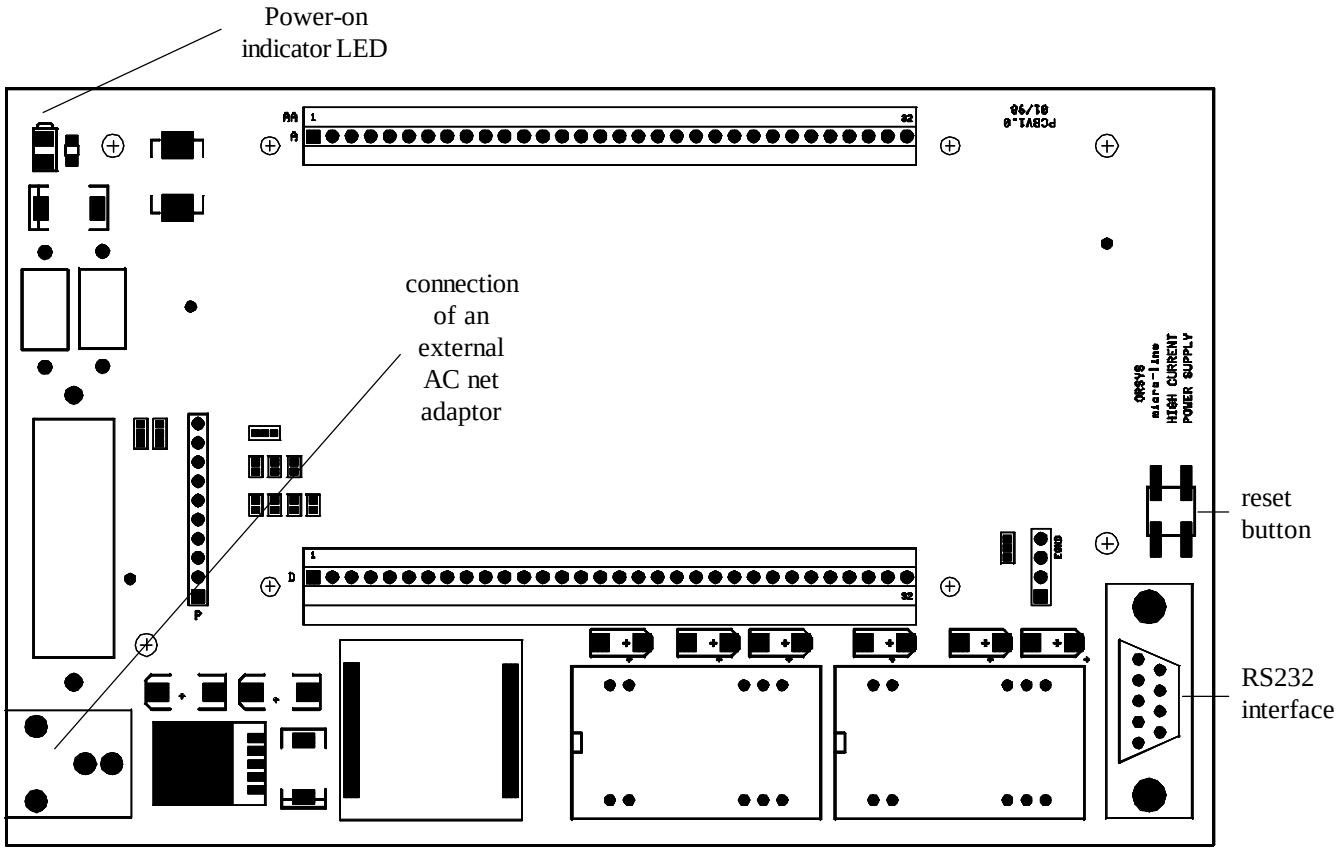
- reset button

- power-on indicator LED

- reverse polarity protection

- board dimensions: 160 x 100 mm (6,23 x 3,93 inches)

2. Operation



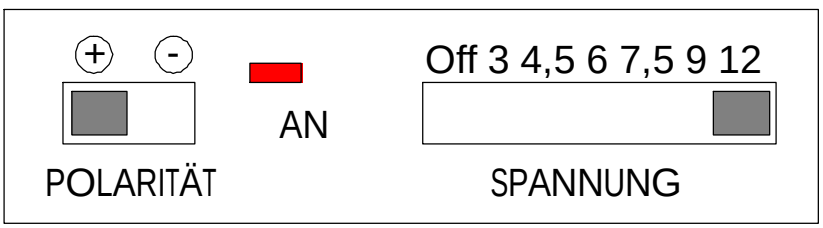
2.1 Connection of the External Power Supply

The supply voltage is provided by the external AC adaptor via the 5,5 mm female plug. The typical supply voltage is 9 to 18V DC (if DC/DC converters are mounted) and 7 to 30V DC (if no DC/DC converters are mounted). The supply voltage does not have to be stabilized. The negative pole is on the outside sheath of the external plug and the positive pole on the inner contact. The power supply on the board is polarity protected. A short circuit occurs in case of reversed voltage. If this occurs for a longer period of time, the external power supply or AC adaptor could be damaged.

Important: The polarity of the external voltage must be checked before switching on the external power supply!

Depending on the power consumption of the plugged micro-line® boards, the external power supply should provide about 200 to 1500mA . The micro-line® Power Supply Kit includes an AC adaptor which provides a maximum of 800mA to supply one micro-line® processor board and a number of peripheral boards, depending on their power consumption.

It is recommended to set the AC adaptor's output voltage to 12V in order to get the maximum power.



2.2 Power Supply from the micro-line® Pins

The primary system supply voltage can also be provided by the two micro-line® pins P9 and P10. This enables a remote power supply without connecting a local AC adaptor, for example, through a network cable like IEEE 1394.

2.3 RS232 Interface

The RS232 lines of the micro-line® processor board are connected to the SUB-D 9 pole male connector with RS232 standardized pinning. The pin-configuration of this SUB-D connector is as follows: RXD (pin 2), TXD (pin 3), RTS (pin 7), CTS (pin 8), GND (pin 5).
For a connection to a development PC, a null-modem cable with connected RTS-CTS lines has to be used. The null-modem cable is also included in the micro-line® Power Supply Kit.

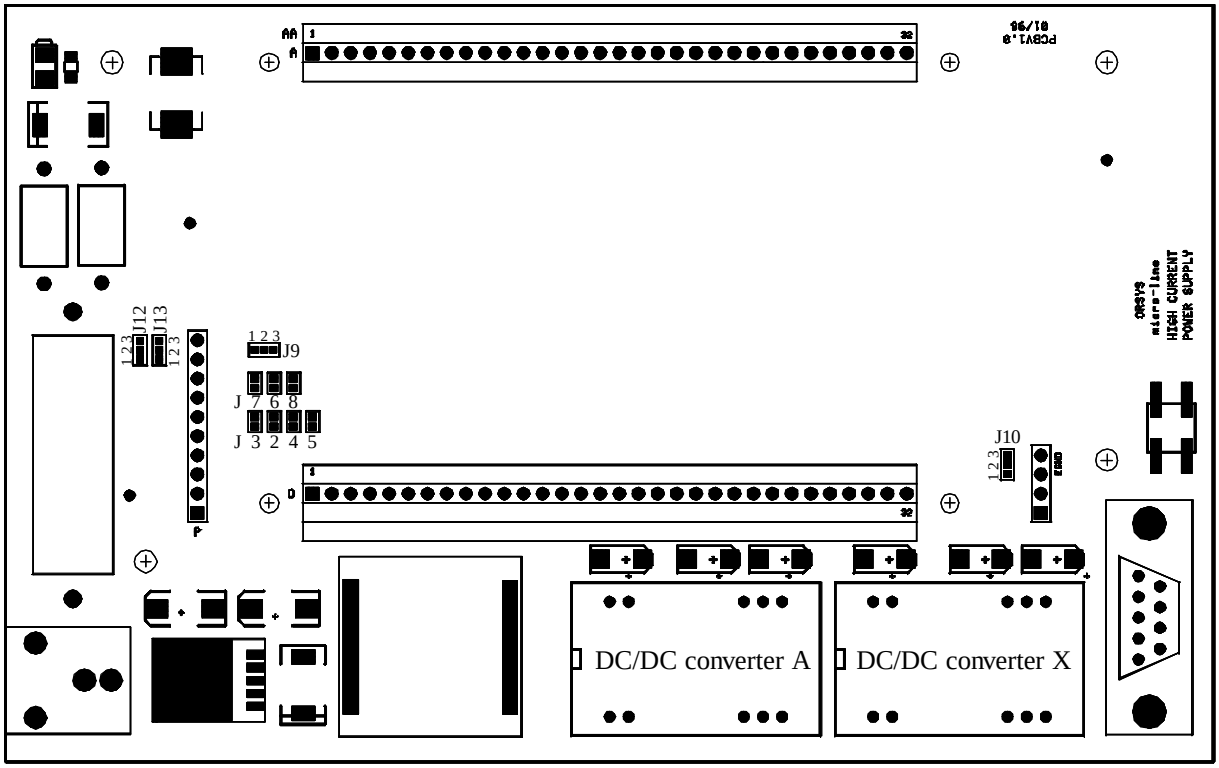
2.4 Reset Button

With the reset button, a hardware reset of the micro-line® system can be triggered manually at any time.

2.5 Power-On Indicator LED

The red LED lights up as soon as the board is supplied with voltage (control function). The LED is supplied by the 5V supply voltage which is produced by the PWM switching regulator.

3. Solder Bridges



For individual adaption of the galvanically isolated voltages to specific application demands, it is possible to set the eleven solder bridges as follows:

3.1 Operation of DC/DC Converter A with parallel Power Supply to Pins A±15V and X±15V (*=default state after delivery at all versions, except /3 and /4*):

The output of DC/DC converter A is connected to the A±15V pins. In order to supply the X±15V pins with the output voltage of DC/DC converter A, solder bridges J3 (A +15V) and J7 (AGND) have to be set. Solder bridge J9 furthermore has to be set to position 1-2 (A -15V).

3.2 Operation of two DC/DC Converters with separate galvanically isolated Power Supplies to Pins A±15V and X±15V (*=default state after delivery at versions /3 and /4*):

The output of DC/DC converter A is connected to the A±15V pins. In order to supply the X±15V pins with the output voltage of DC/DC converter X, solder bridges J2 (X +15V) and J6 (XGND) have to be set. Furthermore, solder bridge J9 has to be set to position 2-3 (X -15V).

3.3 Parallel Connection of the two DC/DC Converters in in order to double the Output Current from ±100mA to ±200mA:

To connect the +15V voltages of the two DC/DC converters in parallel, solder bridges J2 and J3 have to be set. To connect the the -15V voltages of the two DC/DC converters in parallel, all three contacts (position 1-2 and 2-3) of solder bridge J9 have to be connected. To connect the two grounds AGND and XGND, solder bridges J6 and J7 have to be set.

3.4 Supplying the X+15V Pin by the +5V Regulator Voltage

A further configuration possibility of the X+15V pin is to supply it by the regulated digital +5V. In this case, solder bridges J5 and J8 have to be set. The corresponding ground is DGND (connected to the XGND pin by J8).

3.5 Supplying the X+15V Pin by the Output Voltage of the AC Adaptor (up to +30V)

One more configuration possibility of the X+15V pin is to supply it by the AC adaptors unstabilized input voltage (up to +30V). In this case, the solder bridges J4 and J8 have to be set. The corresponding ground is DGND (connected to the XGND pin by J8).

3.6 Connecting EGND Ground to AGND (= *default state after delivery at versions /2 and /4*)

For connecting the Electro Static Discharge Ground EGND with AGND, solder bridge J10 has to be set to position 1-2. Therefore, a leakance via AGND is guaranteed for peripheral boards with overvoltage protection diods at their analog inputs.

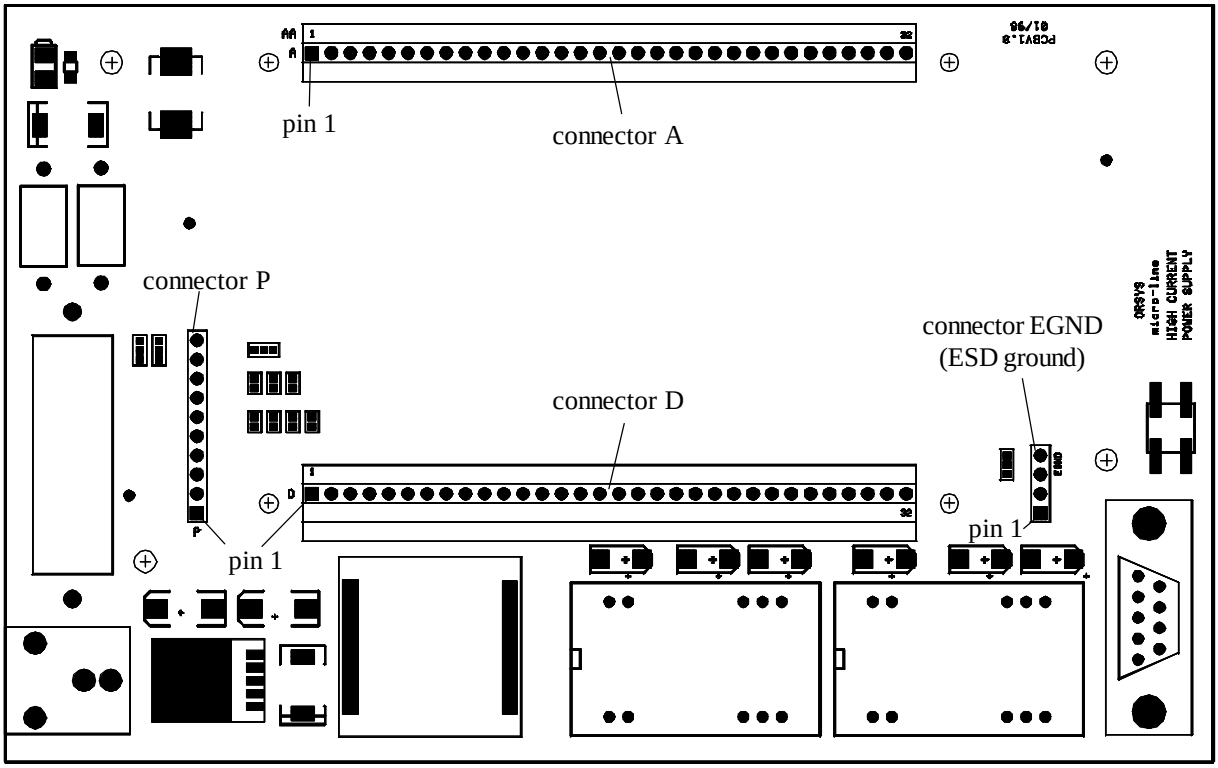
3.7 Connecting EGND Ground to DGND (= *default state after delivery at versions /1 and /3)*

For connecting the Electro Static Discharge Ground EGND with DGND, solder bridge J10 has to be set to position 2-3. Therefore, a leakance via DGND is guaranteed for peripheral boards with overvoltage protection diods at their digital inputs.

3.8 Selecting the Primary Supply Source

The power supply board can be either supplied by an external AC adaptor or by a plugged-on micro-line® board which provides a supply voltage delivered by a network cable (e.g. SC1394-1995 board).
In order to select the supply source, solder bridges J12 and J13 have to be set as mentioned below.
If the power board is supplied by the external AC adaptor, solder bridges J12 and J13 have to be set to position 1-2 (= *default setting after delivery).*
If the power board is supplied via pins P9 and P10 of the P-connector, solder bridges J12 and J13 have to be set to position 2-3.

4. Pin-Configuration



The micro-line® connectors AA, B, C, E, EE and X are not provided.

pin	connector A	connector D	connector EGND	connector P
1	-	DGND	EGND	A+15V
2	-	DGND	EGND	AGND
3	-	DGND	EGND	AGND
4	-	DGND	EGND	A-15V
5	-	D+5V		D+12V
6	-	D+5V		X+15V
7	-	/RESET		XGND
8	-	-		X-15V
9	-	-		PGND
10	-	-		P+12V
.	.	.		
.	.	.		
.	.	.		
26	-	TXD		
27	-	RTS		
28	-	RXD		
29	-	CTS		
30	-	-		
31	-	-		
32	-	-		

5. Pin-Description

The pin-configuration meets the micro-line® standard and is compatible with all micro-line® processor and peripheral boards. A processor board can be operated stand-alone or be connected with one or more piggy-back peripheral boards. Up to seven peripheral boards can simply be plugged onto each other.
In the first case, a +5V supply voltage without DC/DC converter is sufficient to supply the digital circuits (version /1: no ±15V DC/DC converter). In the second case, a DC/DC converter version of the power supply board is usally required to supply the analog components on analog peripheral boards (version /2: one ±15V DC/DC converter). In some particular cases, two separate galvanically isolated ±15V voltages are required (version /4: two ±15V DC/DC converters).

5.1 Connector D

DGND:
Power supply: digital ground

D+5 V:
Digital power supply: +5V. All digital components of plugged-on boards are supplied by these two pins. The voltage on the board is regulated by a +5V switching regulator. The maximum availabe current is 2.5 A.
Important: Supply voltages above 5.5V can destroy any plugged-on boards.

/RESET:
Reset output (active low), drives the /RESETIN pin at plugged-on boards. The signal is switched to ground if the reset button is pressed.

TXD:
Transmit data output of the RS232 interface of the plugged-on micro-line® processor board. The signal is connected to pin 3 of the 9-pole SUB-D connector.

RTS:
Request-to-send output of the RS232 interface of the plugged-on micro-line® processor board. The signal is connected to pin 7 of the 9-pole SUB-D connector.

RXD:
Receive-data input of the RS232 interface of the plugged-on micro-line® processor board. The signal is connected to pin 2 of the 9-pole SUB-D connector.

CTS:
Clear-to-send input of the RS232 interface of the plugged-on micro-line® processor board. The signal is connected to pin 8 of the 9-pole SUB-D connector.

5.2 Connector EGND

ESD ground (Electro Static Discharge). This additional connector provides four EGND pins. Possibly occuring overvoltages on the input and output pins of the plugged-on micro-line® boards lead to these ESD pins. The ESD pins can be connected to the analog ground in order to protect analog peripheral boards or to the digital ground in order to protect digital peripheral boards by solder bridge J10.

5.3 Connector P

The P-connector provides up to four clean and galvanically isolated voltages which are generated by either one or two high-quality DC/DC converters in order to supply the analog components of the peripheral boards.

A +15 V
First analog positive supply voltage. The maximum current is +100mA. In order to increase the maximum current, A+15V and X+15V can be connected by a solder bridge. Afterwards, a resulting current of +200mA is available.

A -15 V
First analog negative supply voltage. The maximum current is -100mA. In order to increase the maximum current, A-15V and X-15V can be connected by a solder bridge. Afterwards, a resulting current of -200mA is available.

AGND
First analog ground. A high-quality ground, galvanically isolated from DGND and XGND.

D +12V
Digital Power Supply. This connector can be used to supply a peripheral board directly form the unstabilized ACM adapotor voltage (e.g. Relay board). The corresponding ground potential for this volatge is DGND.

X +15 V
Second analog positive supply voltage. The maximum current is +100mA.

X -15 V
Second analog negative supply voltage. The maximum current is -100mA.

XGND
Second extended analog ground. A high-quality ground, galvanically isolated from DGND and AGND.

PGND
Power ground. This connector is on DGND potential and is used for supplying the system by a peripheral board with external network power supply (e.g. SC1394-1995).

P +12V
Power +12V. This connector is used for supplying the system by a peripheral board with external network power supply (e.g. SC1394-1995).